

I CLAIM:

1. A bending pipe element made of metal for bending pipe sections and for return pipes in internal combustion automobile engines, the pipe element comprising:

a first set of undulations having a first outer diameter; and

a second set of undulations having a second outer diameter different than said first outer diameter, said first and said second sets of undulations being disposed one behind the other in a longitudinal direction of the pipe element, wherein said second set of undulations is interposed between neighboring pairs of said first set of undulations and said first set of undulations is interposed between neighboring pairs of said second set of undulations.

2. The pipe element of claim 1, wherein said first outer diameter of said first set of undulations exceeds said second outer diameter of said second set of undulations by 5 to 20%, relative to said second outer diameter.
3. The pipe element of claim 1, wherein said first outer diameter exceeds said second outer diameter by 10% to 15%, relative to said second outer diameter.

4. The pipe element of claim 1, wherein said first undulations of the unbent pipe element have an approximately same circular-segment shape.
5. The pipe element of claim 4, wherein said second set of undulations of the unbent pipe element have said approximately same circular-segment shape.
6. The pipe element of claim 4, wherein said first set and said second set of undulations have an approximately equal inner and outer radius.
7. The pipe element of claim 4, wherein, in the unbent pipe element, an inner radius and an outer radius of said first and said second set of undulations describe circular arcs of between 175° to 230° .
8. The pipe element of claim 4, wherein, in the unbent pipe element, an inner radius and an outer radius of said first and said second set of undulations describe a circular arc of approximately 180° .
9. The pipe element of claim 4, wherein straight sections are disposed in the unbent pipe element between the inner and outer radius of said approximately circular-segment shaped first and second sets of undulations.

10. The pipe element of claim 1, further comprising substantially cylindrical, non-undulated connecting ends.
11. The pipe element of claim 10, wherein an average outer diameter of said first and said second sets of undulations exceeds an outer diameter of said connecting ends by 10% to 35%, relative to said outer diameter of said connecting ends.
12. The pipe element of claim 1, wherein said first and said second sets of undulations are fashioned from a wall thickness of between 0.2mm and 0.5mm.
13. The pipe element of claim 1, wherein said first and said second sets of undulations are fashioned from a wall thickness of approximately 0.4mm.